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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,826	12/21/2000	Ari Heikkinen	397.39397X00	6582
20457	7590	01/27/2004	EXAMINER HARPER, V PAUL	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			ART UNIT 2654	PAPER NUMBER 11

DATE MAILED: 01/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/740,826

Applicant(s)

HEIKKINEN ET AL.

Examiner

V. Paul Harper

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12/05/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The substitute specification filed 12/5/05 has been entered.

### *Claim Objections*

2. All relevant objections are withdrawn as being satisfied.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1-3 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Swaminathan et al. (U.S. Patent 5,734,789), hereinafter referred to as Swaminathan.

Regarding claims 1 and 8, Swaminathan discloses a method for determining voiced and unvoiced modes in a vocoder. Swaminathan's method includes the following steps: **"dividing a speech signal segment into sub-segments"** (Figs. 15 and 17, col. 9, lines 9-30); **"determining a value relating to the voicing of respective speech signal sub-segments"** (col. 8, lines 20-25); **"comparing said values with a predetermined threshold"** (Fig. 15, items 15018 et seq., Fig. 17, items 17030 et seq.);

Art Unit: 2654

**“making a decision on the voicing of the speech segment based on the number of the values on one side of the threshold”** (Fig. 15, item 15035, Fig. 17, item 17050); **“with emphasis on at least one last sub-segment of the segment”** (col. 16, lines 1-15, pitch gain indices for the subframes, including specific values for the last sub-frame in line 10).

Regarding claims 2 and 9, Swaminathan teaches everything claimed, as applied above (see claims 1 and 8, respectively). In addition, Swaminathan teaches, **“making a decision is based on whether the value relating to the voicing of the last sub-segment is on the one side of the threshold”** (Fig. 15, item 15032, and Fig. 17, item 17022, where the last sub-frame value is used in the decision; and the description of the delayed decision approach where the decision is made after the last sub-frame, col. 11, lines 5-56, in particular, lines 45-50).

Regarding claims 3 and 10, Swaminathan teaches everything claimed, as applied above (see claims 1 and 8, respectively). In addition, Swaminathan teaches, **“making a decision is based on whether the values relating to the voicing of last  $K_{tr}$  sub-segments are on the one side of the threshold”** (Fig. 15, item 15032 and preceding, and Fig. 17, item 17022 and preceding, where the last sub-frames values are used in the decision; and col. 16, lines 1-15 as argued above).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2654

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-7 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swaminathan in view of Hess ("Pitch and voicing determination," in *Advances in Speech Signal Processing*, S. Furui et al. (eds), 1992).

Regarding claims 4, 11, 13 and 14 Swaminathan teaches everything claimed, as applied above (see claims 1, 8, 9, and 10 respectively). In addition, Swaminathan teaches testing the counter's final value against a fixed threshold (col. 9, lines, 24-25), but Swaminathan does not specifically teach **"making a decision is based on whether the values relating to the voicing of substantially half of the sub-segments of the speech signal segment are on the one side of the threshold."** However, the examiner contends that this concept was well known in the art, as taught by Hess.

In the same field of endeavor, Hess teaches techniques for voicing determination where adjacent frames are checked and the decision is made using a medial smoother (i.e., the middle value setting the threshold to substantially half of the sub-segments) (p. 33, §2.1, ¶1, in particular the last two sentences).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Swaminathan by specifically providing the decision technique, as taught by Hess, since this is an effective way to make a voicing determination when the signal is noisy (p. 33, §2.1, ¶1).

Art Unit: 2654

Regarding claims 5 and 12, Swaminathan in view of Hess teach everything claimed, as applied above (see claims 1 and 8, respectively). But Swaminathan does not specifically teach **“value related to voicing of respective speech signal sub-segments comprises an autocorrelation value.”** However, the examiner contends that this concept was well known in the art, as taught by Hess.

In the same field of endeavor, Hess teaches pitch and voice determination where an autocorrelation can be performed to determine pitch (p. 10, §1.3) and the pitch can be used to determine voicing (p. 33, §2.1, ¶1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Swaminathan by specifically providing the autocorrelation technique, as taught by Hess, since it was well-know that this technique could be applied to accurately determine voicing.

Regarding claim 6, Swaminathan in view of Hess teach everything claimed, as applied above (see claim 5). But Swaminathan does not specifically teach **“the estimated pitch period is determined based on said autocorrelation value”**. However, the examiner contends that this concept was well known in the art, as taught by Hess.

Hess further teaches the use of autocorrelation to determine pitch period (lag) (p. 12, §1.3.2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Swaminathan in view of Hess by specifically using the autocorrelation technique to calculate pitch period, as taught by Hess, since

Art Unit: 2654

the use of autocorrelation was well-known and a standard technique for determining pitch period.

Regarding claim 7, Swaminathan teaches everything claimed, as applied above (see claim 7). In addition, Swaminathan teaches the classification of each signal into one of three modes (abstract, col. 6, lines 35-45), but Swaminathan does not specifically teach **“the determining the voicing of a speech signal segment comprises a voiced/unvoiced decision.”** However, the examiner contends that this concept was well known in the art, as taught by Hess.

In the same field of endeavor, Hess teaches techniques for making voicing decisions (i.e. voiced/unvoiced) (p. 32, §2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Swaminathan by specifically providing a voice/unvoiced decision, as taught by Hess, since it was well-known that such a determination is useful in voice source analysis (Hess, p. 3, ¶1).

### ***Response to Arguments***

5. Applicant's arguments filed 12/05/03 have been fully considered but they are not persuasive. In view of the amended independent claims 1 and 8, new sections of Swaminathan have been indicated in the rejections and as argued below.

6. Applicant asserts on page 7:

Swaminathan does not disclose nor render obvious the making a decision on the voicing of the speech segment based on the number of the values

on one side of the threshold and with emphasis on at least one last sub-segment of the segment as recited in claim 1 and in claim 8. Figs. 15 and 17 of Swaminathan disclose the summation of sub-segments, which have been compared with items 15035 and 17050 as noted by the Examiner, but do not disclose the claimed emphasis. There is no basis in the record why a person of ordinary skill in the art would be led to modify the teachings of Swaminathan to arrive at the subject matter of independent claims 1 and 8 including the emphasis on at least one last sub-segment.

As indicated in the rejection of claims 1 and 8, Swaminathan teaches the special processing of the last sub-frame by adjusting indices (col. 16, lines 5-12) and uses a delayed decision approach (col. 11, lines 47-55), which correspond to "emphasis on at least one last sub-segment."

7. Applicant asserts on page 8:

Claim 2 further limits claim 1 in reciting "wherein said step of making a decision is based on whether the value relating to the voicing of the last subsegment is on the one side of the threshold and claim 9 further limits claim 8 in reciting wherein said means for making a decision comprises means for determining if a value of the last sub-segment is on the one side of the threshold". The Examiners interpretation of the use of the last subframe value being weighed in Swaminathan is correct. However, it is submitted that the language of claims 2 and 9 requires *the last segment to be the decision making quantity* which is not taught by Swaminathan since the multiple segments are merely weighed in the decision process with all sub-segments. (Italics added)

The limitation states that "making a decision is based on whether the value relating to the voicing of the last sub-segment is on one side of the threshold," where Swaminathan teaches that a delayed decision approach is used, which when the calculations are near the threshold could result in the decision being based on the value of the last sub-segment relative to the threshold (col. 11, lines 47-55).



8. Applicant asserts starting on page 8:

Claims 4-7 and 11 -14 stand rejected under 35 U.S.C. §103 as being unpatentable over Swaminathan in view of Hess. Hess is cited as teaching "techniques for voicing determination where adjacent frames are checked a decision is used making a median smoother". *Hess does not cure the deficiencies noted above with regard to Swaminathan not teaching emphasis on at least one last subsegment of the segment as recited in independent claims 1 and 8.* Accordingly, it is submitted that claims 4-7 and 11 -14 are patentable for the reasons set forth above in that Hess does not cure the deficiencies noted with regard to Swaminathan and furthermore, *the suggested modification of Swaminathan with Hess would not be made by a person of ordinary skill in the art for the reason that there is no reason why a person of ordinary skill in the art would be motivated to make the suggested modification except by impermissible hindsight.* The Examiner seems to predicate Hess being in the same field of endeavor with that being sufficient motivation to modify Swaminathan. However, being in the same field of endeavor does not demonstrate motivation to combine. (Italics added)

See ¶6, above. Furthermore, in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention

Art Unit: 2654

where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the teachings of Hess were added since they improve noise tolerance during the voicing determination (Hess, p. 33, §2.1, ¶1).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks  
P.O. Box 1450

Application/Control Number: 09/740,826  
Art Unit: 2654

Page 10

Alexandria, VA 22313-1450

or faxed to:

(703) 872-9314

Hand-delivered responses should be brought to:

Crystal Park II  
2121 Crystal Drive  
Arlington, VA.  
Sixth Floor (Receptionist)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. V. Paul Harper whose telephone number is (703) 305-4197. The examiner can normally be reached on Monday through Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (703) 305-9645. The fax phone number for the Technology Center 2600 is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service office whose telephone number is (703) 306-0377.



VPH/vph  
January 20, 2004



**RICHEMOND DORVIL**  
**SUPERVISORY PATENT EXAMINER**